

FOREWORD

1. The Globally Harmonized System of Classification and Labelling of Chemicals (GHS) is the culmination of more than a decade of work. There were many individuals involved, from a multitude of countries, international organizations, and stakeholder organizations. Their work spanned a wide range of expertise, from toxicology to fire protection, and ultimately required extensive goodwill and the willingness to compromise, in order to achieve this system.

2. The work began with the premise that existing systems should be harmonized in order to develop a single, globally harmonized system to address classification of chemicals, labels, and safety data sheets. This was not a totally novel concept since harmonization of classification and labelling was already largely in place for physical hazards and acute toxicity in the transport sector, based on the work of the United Nations Economic and Social Council's Committee of Experts on the Transport of Dangerous Goods. Harmonization had not been achieved in the workplace or consumer sectors, however, and transport requirements in countries were often not harmonized with those of other sectors.

3. The international mandate that provided the impetus for completing this work was adopted at the 1992 United Nations Conference on Environment and Development (UNCED), as reflected in Agenda 21, para.19.27:

"A globally harmonized hazard classification and compatible labelling system, including material safety data sheets and easily understandable symbols, should be available, if feasible, by the year 2000".

4. The work was coordinated and managed under the auspices of the Interorganization Programme for the Sound Management of Chemicals (IOMC) Coordinating Group for the Harmonization of Chemical Classification Systems (CG/HCCS). The technical focal points for completing the work were the International Labour Organization (ILO); the Organisation for Economic Co-operation and Development (OECD); and the United Nations Economic and Social Council's Sub-Committee of Experts on the Transport of Dangerous Goods.

5. Once completed in 2001, the work was transmitted by the IOMC to the new United Nations Economic and Social Council's Sub-Committee of Experts on the Globally Harmonized System of Classification and Labelling of Chemicals (GHS Sub-Committee). The Sub-Committee was established by Council resolution 1999/65 of 26 October 1999 as a subsidiary body of the former Committee of Experts on the Transport of Dangerous Goods, which was reconfigured and renamed on the same occasion "Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals" (hereafter referred to as "the Committee"). The Committee and its sub-committees work on a biennial basis. Secretariat services are provided by the Transport Division of the United Nations Economic Commission for Europe (UNECE).

6. The GHS Sub-Committee is responsible for maintaining the GHS, promoting its implementation and providing additional guidance as needs arise, while maintaining stability in the system to encourage its adoption. Under its auspices, the document is regularly revised and updated to reflect national, regional and international experiences in implementing its requirements into national, regional and international laws, as well as the experiences of those doing the classification and labelling.

7. The first task of the GHS Sub-Committee was to make the GHS available for worldwide use and application. The first version of the document, which was intended to serve as the initial basis for the global implementation of the system, was approved by the Committee at its first session (11-13 December 2002) and published in 2003 under the symbol ST/SG/AC.10/30. Since then, the GHS has been updated every two years.

8. At its sixth session (14 December 2012), the Committee adopted a set of amendments to the fourth revised edition of the GHS which include, *inter alia*, a new test method for oxidizing solids, miscellaneous provisions intended to further clarify the criteria for some hazard classes (skin corrosion/irritation, severe eye

damage/irritation, and aerosols) and to complement the information to be included in the Safety Data Sheet; revised and simplified classification and labelling summary tables; a new codification system for hazard pictograms, and revised and further rationalized precautionary statements. The fifth revised edition of the GHS takes account of these amendments which were circulated as document ST/SG/AC.10/40/Add.3.

9. While Governments, regional institutions and international organizations are the primary audiences for the GHS, it also contains sufficient context and guidance for those in industry who will ultimately be implementing the national requirements which are adopted. Availability of information about chemicals, their hazards, and ways to protect people, will provide the foundation for national programmes for the safe management of chemicals. Widespread management of chemicals in countries around the world will lead to safer conditions for the global population and the environment, while allowing the benefits of chemical use to continue. Harmonization will also have benefits in terms of facilitating international trade, by promoting greater consistency in the national requirements for chemical hazard classification and communication that companies engaged in international trade must meet.

10. In paragraph 23 (c) of its Plan of Implementation adopted in Johannesburg on 4 September 2002, the World Summit on Sustainable Development (WSSD) encouraged countries to implement the GHS as soon as possible with a view to having the system fully operational by 2008. Subsequently, in its resolutions 2003/64 of 25 July 2003, 2005/53 of 27 July 2005, 2007/6 of 23 July 2007, 2009/19 of 29 July 2009 and 2011/25 of 27 July 2011, the United Nations Economic and Social Council invited Governments that had not yet done so, to take the necessary steps, through appropriate national procedures and/or legislation, to implement the GHS as recommended in the WSSD Plan of Implementation. It also reiterated its invitation to the regional commissions, United Nations programmes, specialized agencies and other organizations concerned, to promote the implementation of the GHS and, where relevant, to amend their international legal instruments addressing transport safety, workplace safety, consumer protection or the protection of the environment so as to give effect to the GHS through such instruments. Information about the status of implementation may be found on the UNECE Transport Division website¹.

11. This publication has been prepared by the secretariat of the United Nations Economic Commission for Europe (UNECE).

12. Additional information on the work of the Committee and its two sub-committees, as well as corrigenda (if any) which may be issued after publication of this document, can be found on the UNECE Transport Division website².

¹ www.unece.org/trans/danger/publi/ghs/implementation_e.html.

² www.unece.org/trans/danger/danger.htm and www.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html.

TABLE OF CONTENTS

Page

Part 1. INTRODUCTION

Chapter 1.1	Purpose, scope and application of the GHS	3
Chapter 1.2	Definitions and abbreviations.....	11
Chapter 1.3	Classification of hazardous substances and mixtures.....	17
Chapter 1.4	Hazard communication: Labelling	23
Chapter 1.5	Hazard communication: Safety Data Sheets (SDS).....	35

Part 2. PHYSICAL HAZARDS

Chapter 2.1	Explosives.....	43
Chapter 2.2	Flammable gases (including chemically unstable gases)	53
Chapter 2.3	Aerosols	57
Chapter 2.4	Oxidizing gases	61
Chapter 2.5	Gases under pressure	65
Chapter 2.6	Flammable liquids	69
Chapter 2.7	Flammable solids.....	73
Chapter 2.8	Self-reactive substances and mixtures.....	75
Chapter 2.9	Pyrophoric liquids	81
Chapter 2.10	Pyrophoric solids.....	83
Chapter 2.11	Self-heating substances and mixtures.....	85
Chapter 2.12	Substances and mixtures which, in contact with water, emit flammable gases	89
Chapter 2.13	Oxidizing liquids	93
Chapter 2.14	Oxidizing solids.....	97
Chapter 2.15	Organic peroxides.....	101
Chapter 2.16	Corrosive to metals.....	107

TABLE OF CONTENTS (cont'd)

	Page
Part 3. HEALTH HAZARDS	
Chapter 3.1 Acute toxicity	111
Chapter 3.2 Skin corrosion/irritation.....	123
Chapter 3.3 Serious eye damage/eye irritation.....	135
Chapter 3.4 Respiratory or skin sensitization.....	149
Chapter 3.5 Germ cell mutagenicity	159
Chapter 3.6 Carcinogenicity.....	167
Chapter 3.7 Reproductive toxicity	177
Chapter 3.8 Specific target organ toxicity – Single exposure	189
Chapter 3.9 Specific target organ toxicity – Repeated exposure	201
Chapter 3.10 Aspiration hazard.....	211
Part 4. ENVIRONMENTAL HAZARDS	
Chapter 4.1 Hazardous to the aquatic environment	219
Chapter 4.2 Hazardous to the ozone layer.....	245
ANNEXES	
Annex 1 Classification and labelling summary tables	249
Annex 2 (<i>Reserved</i>)	265
Annex 3 Codification of hazard statements, codification and use of precautionary statements, codification of hazard pictograms and examples of precautionary pictograms	267
Annex 4 Guidance on the preparation of Safety Data Sheets (SDS)	375
Annex 5 Consumer product labelling based on the likelihood of injury.....	395
Annex 6 Comprehensibility testing methodology.....	401
Annex 7 Examples of arrangements of the GHS label elements	417
Annex 8 An example of classification in the Globally Harmonized System.....	427
Annex 9 Guidance on hazards to the aquatic environment.....	435
Annex 10 Guidance on transformation/dissolution of metals and metal compounds in aqueous media.....	517